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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/605,736	10/22/2003	Robin L Wang	19441-0011	2735
29052	7590	06/08/2006	EXAMINER	
SUTHERLAND ASBILL & BRENNAN LLP 999 PEACHTREE STREET, N.E. ATLANTA, GA 30309			WARTALOWICZ, PAUL A	
			ART UNIT	PAPER NUMBER
			1754	

DATE MAILED: 06/08/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/605,736	Applicant(s) WANG ET AL.	
	Examiner Paul A. Wartalowicz	Art Unit 1754	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 4/5/6.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-11 and 13-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 and 13-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Arguments***

Applicant's arguments filed on January 5, 2006 have been fully considered but they are not persuasive.

Applicant argues that search and examination of Groups I and II together would not present an undue burden.

This argument is not persuasive for the following reason: The search for Group I is substantially different than the search for Group II such that restriction is proper as evidenced by: The search for Group I includes 423/418.2,648.1, the search for Group II does not. The search for Group II includes 422/211 and 502/439, the search for Group I does not. Therefore, the restriction is deemed FINAL and PROPER.

Applicant argues the element of a process essentially free of water or steam is not disclosed in Isogaya et al.

This argument is not persuasive for the following reason: Isogaya et al. is not relied upon to teach a process essentially free of water or steam. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Applicant argues that none of these references (Isogaya, Rudy, or Voeste) teach or suggest the process of converting hydrocarbons to syngas is performed essentially free of steam or water, specifically tat the Examiner improperly construes Voeste as providing for a feed gas essentially free of water when Voeste discloses that “in case of need, the water vapor content of the mixture may be increased in that the water vapor is supplied in the combustion gas or in the preheated remaining hydrocarbons”.

This argument is not persuasive for the following reason: Voeste et al. produces a product gas without the formation of soot although water vapor is not added (col. 1, lines 39-43). This is evidence no water is added in the process of Voeste et al. The quotation used by applicant “in case of need, the water vapor content of the mixture may be increased in that the water vapor is supplied in the combustion gas or in the preheated remaining hydrocarbons” is not further limiting in that it does not require that the invention of the process have water added to it, the quotation is meant as a specific case wherein water could be added. This is evidenced by the quotation “It will not be necessary in general to add water vapor to that mixture from the outside”.

Applicant argues that nothing in claims 1-28 of the co-pending application would motivate one skilled in the art to select a particular combination of features defining the present Applicant's claims and that an overlapping limitation does not equate to motivation.

This argument is not persuasive for the following reason: Application No. 10/605737 teaches a catalytic structure disposed in the catalytic reaction zone

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comprising an oxidation catalyst supported on an open-channel support, feeding a feed gas mixture comprising an oxygen containing gas and a heavy hydrocarbon fuel and passing the said feed gas mixture through said catalytic structure, maintaining the catalytic reaction zone at a temperature sufficient to convert the feed gas mixture to an exit gas stream containing hydrogen and carbon monoxide as main reaction products (claim 7). Isogaya et al., however teach a process for conversion of hydrocarbon fuel to produce an exit gas stream containing hydrogen and carbon monoxide as main reaction products (col. 1, lines 6-10) wherein a catalytic structure comprising an oxidation catalyst and a steam reforming catalyst (alkali aluminate or tungsten containing nickel catalyst in the first catalyst bed and aluminum oxide or nickel oxide in the second catalyst bed, col. 2, lines 60-67) with steam reforming is effected in the first bed and partial oxidation is effected in the second bed (col. 6, lines 50-54) for the purpose of producing an exit stream containing hydrogen and carbon monoxide as main reaction products (col. 6, lines 55-63). The motivation for the combination stems from the fact that both Isogaya et al. and Application No. 10/605737 produce a syngas from hydrocarbons with a catalyst.

Applicant argues that Isogaya do not suggest the present claims.

This argument is not persuasive for the following reason: Isogaya et al., however teach a process for conversion of hydrocarbon fuel to produce an exit gas stream containing hydrogen and carbon monoxide as main reaction products (col. 1, lines 6-10) wherein a catalytic structure comprising an oxidation catalyst and a steam reforming

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catalyst (alkali aluminate or tungsten containing nickel catalyst in the first catalyst bed and aluminum oxide or nickel oxide in the second catalyst bed, col. 2, lines 60-67) with steam reforming is effected in the first bed and partial oxidation is effected in the second bed (col. 6, lines 50-54) for the purpose of producing an exit stream containing hydrogen and carbon monoxide as main reaction products (col. 6, lines 55-63). Isogaya et al. is not relied upon to teach the limitations which are taught by Application No. 10/605737 or Voeste et al. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1 and 15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The term "essentially free" in claims 1 and 15 is a relative term that renders the claim indefinite. The term "essentially free" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. For the

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purposes of further examination, the term “essentially free” will be interpreted as “not added to the process” as evidenced on page 5, lines 4-5 of the specification and “without steam input” on page 8, lines 17-19 of the specification.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-3, 6, 8, 9, 13, 14, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Isogaya et al. (U.S. 4331451) in view of Voeste et al. (U.S. 4854943).

Isogaya et al. teach a process for conversion of hydrocarbon fuel to produce an exit gas stream containing hydrogen and carbon monoxide as main reaction products (col. 1, lines 6-10) providing a feed gas mixture comprising an oxygen-containing gas and kerosene (col. 2, lines 55-58), providing a catalytic structure comprising an oxidation catalyst and a steam reforming catalyst (alkali aluminate or tungsten



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containing nickel catalyst in the first catalyst bed and aluminum oxide or nickel oxide in the second catalyst bed, col. 2, lines 60-67) with steam reforming is effected in the first bed and partial oxidation is effected in the second bed (col. 6, lines 50-54) supported on a fluidized bed (col. 6, lines 47-49) wherein the catalyst is maintained at 800-1300 ° C (col. 4, lines 45-50) wherein the residence time in the reaction zone is 0.1-10 seconds (col. 7, lines 50-52) and the process deposits less than 1% of total carbon in said hydrocarbon fuel as elemental carbon and carbon-rich compounds (Table 1, Run 5) wherein the product gas can be supplied to a fuel cell (col. 7, lines 35-38). Isogaya et al. fail to teach wherein said feed gas mixture being essentially free of water.

Voeste et al., however, teach a process for combusting hydrocarbons (col. 1, lines 43-45) wherein the process for conversion of hydrocarbon fuel operates with 3.13% of water by volume (3.13% by volume of water is equivalent to essentially free of steam or water, col. 3, lines 15-24) for the purpose of carrying out the combustion of a hydrocarbon gas stream to produce a syngas (col. 3, lines 32-42).

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to provide wherein the process for conversion of hydrocarbon fuel operates with 3.13% of water by volume (3.13% by volume of water is equivalent to essentially free of steam or water, col. 3, lines 15-24) in Isogaya et al. in order to carry out the combustion of a hydrocarbon gas stream to produce a syngas (col. 3, lines 32-42).

If Voeste et al. do not teach a process wherein the gas mixture is essentially free of steam or water, Voeste et al. teach a process for combusting hydrocarbons (col. 1,



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lines 43-45) wherein no water is added for the purpose of high production of CO gas (col. 4, lines 6-9).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to optimize the water content in the process, since it has been held that discovering an optimum value or a result effective variable involved only routine skill in the art. In re Boesch, 617 F.2<sup>nd</sup> 272, 205 USPQ 215 (CCPA 1980). The artisan would have been motivated to optimize the water content in the process by the reasoned explanation that the water content can be optimized to obtain maximum CO production.

Claims 4, 5, 7, and 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Isogaya et al. (U.S. 4331451) in view of Voeste et al. (U.S. 4854943) and Rudy (U.S. 5010051).

Isogaya et al. teach a process for conversion of hydrocarbon fuel as described in claim 1. Isogaya et al. fail to teach wherein said oxidation catalyst is the noble metal rhodium and wherein said steam reforming catalyst comprises rhodium and wherein open-channel support comprises a ceramic monolith and wherein said open-channel support comprises a porous alumina monolith.

Rudy, however, teaches a process for the oxidation of hydrocarbons (col. 1, lines 14-16) wherein rhodium is a catalyst dispersed on activated alumina (col. 3, lines 44-48) for the purpose of oxidizing hydrocarbons (col. 3, lines 8-11).

Therefore, it would have been obvious to one of ordinary skill in the art to provide rhodium on activated alumina (col. 3, lines 44-48) in Isogaya et al. in order to oxidize hydrocarbons (col. 3, lines 8-11) in a chemically similar process for oxidation of hydrocarbons (col. 1, lines 14-16) as taught by Rudy.

Rudy also teaches a process for the oxidation of hydrocarbons (col. 1, lines 14-16) wherein porous activated alumina support and a ceramic support (col. 6, lines 1-5) for the purpose of attaining at least 50% conversion for hydrocarbons (col. 6, lines 9-11).

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to provide a porous activated alumina support and a ceramic support (col. 6, lines 1-5) in Isogaya et al. in order to attain at least 50% conversion for hydrocarbons (col. 6, lines 9-11) in a chemically similar process for oxidation of hydrocarbons (col. 1, lines 14-16) as taught by Rudy.

### ***Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory

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double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claim 1 is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 7 of copending Application No. 10/605737 in view of Isogaya et al. (U.S. 4331451) and Voeste et al. (U.S. 4854943). Application No. 10/605737 teaches a catalytic structure disposed in the catalytic reaction zone comprising an oxidation catalyst supported on an open-channel support, feeding a feed gas mixture comprising an oxygen containing gas and a heavy hydrocarbon fuel and passing the said feed gas mixture through said catalytic structure, maintaining the catalytic reaction zone at a temperature sufficient to convert the feed gas mixture to an exit gas stream containing hydrogen and carbon monoxide as main reaction products (claim 7). Application No. 10/605737 fails to teach a steam-reforming catalyst and an oxidation catalyst wherein the steam-reforming catalyst is different from the oxidation catalyst and wherein the process for conversion of hydrocarbon fuel operates essentially free of steam or water.

Isogaya et al., however teach a process for conversion of hydrocarbon fuel to produce an exit gas stream containing hydrogen and carbon monoxide as main reaction products (col. 1, lines 6-10) wherein a catalytic structure comprising an oxidation catalyst and a stream reforming catalyst (alkali aluminate or tungsten containing nickel catalyst in the first catalyst bed and aluminum oxide or nickel oxide in the second catalyst bed, col. 2, lines 60-67) with steam reforming is effected in the first bed and

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partial oxidation is effected in the second bed (col. 6, lines 50-54) for the purpose of producing an exit stream containing hydrogen and carbon monoxide as main reaction products (col. 6, lines 55-63).

Therefore it would have been obvious to one of ordinary skill in the art to provide a catalytic structure comprising an oxidation catalyst and a stream reforming catalyst (alkali aluminate or tungsten containing nickel catalyst in the first catalyst bed and aluminum oxide or nickel oxide in the second catalyst bed, col. 2, lines 60-67) with steam reforming is effected in the first bed and partial oxidation is effected in the second bed (col. 6, lines 50-54) in Application No. 10/605737 in order to produce an exit stream containing hydrogen and carbon monoxide as main reaction products (col. 6, lines 55-63) in a chemically similar reaction as taught by Isogaya et al.

As to the limitation wherein the process for conversion of hydrocarbon fuel operates essentially free of steam or water, Voeste et al., however, teach a process for combusting hydrocarbons (col. 1, lines 43-45) wherein the process for conversion of hydrocarbon fuel operates with 3.13% of water by volume (3.13% by volume of water is equivalent to essentially free of steam or water, col. 3, lines 15-24) for the purpose of carrying out the combustion of a hydrocarbon gas stream to produce a syngas (col. 3, lines 32-42).

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to provide wherein the process for conversion of hydrocarbon fuel operates with 3.13% of water by volume (3.13% by volume of water is equivalent to essentially free of steam or water, col. 3, lines 15-24) in Isogaya et al. in

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order to carry out the combustion of a hydrocarbon gas stream to produce a syngas (col. 3, lines 32-42).

If Voeste et al. do not teach a process wherein the gas mixture is essentially free of steam or water, Voeste et al. teach a process for combusting hydrocarbons (col. 1, lines 43-45) wherein no water is added for the purpose of high production of CO gas (col. 4, lines 6-9).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to optimize the water content in the process, since it has been held that discovering an optimum value or a result effective variable involved only routine skill in the art. In re Boesch, 617 F.2<sup>nd</sup> 272, 205 USPQ 215 (CCPA 1980). The artisan would have been motivated to optimize the water content in the process by the reasoned explanation that the water content can be optimized to obtain maximum CO production.

This is a provisional obviousness-type double patenting rejection.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul A. Wartalowicz whose telephone number is (571) 272-5957. The examiner can normally be reached on 8:30-6 M-Th and 8:30-5 on Alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on (571) 272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

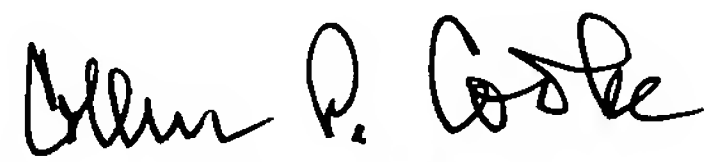


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Paul Wartalowicz  
May 31, 2006



**COLLEEN P. COOKE**  
**PRIMARY EXAMINER**